Message

From: "jeff parker" ["jeff parker" Ex. 6 PII
Sent: 3/18/2011 11:00:36 PM
To: Phil North/R10/USEPA/US@EPA
Subject: FW: [bbwg] Wardrop Preliminary Assessment Technical Report
Attachments: mime.htm; image002.gif; message-footer.txt

FYI

From: bbwg-request@npogroups.org [mailto:bbwg-request@npogroups.org] On Behalf Of David Chambers
Sent: Friday, March 18, 2011 2:08 PM
To: BBWG Working Group
Subject: [bbwg] Wardrop Preliminary Assessment Technical Report

I have reviewed the recently released Preliminary Assessment of the Pebble Project, Southwest Alaska, Wardrop-Northern Dynasty Mines, February 17, 2011.

I am including some notes that I took for my own benefit, but though that some of you might be interested in seeing them. Text from the report appears in italics (usually with quotes), and my comments are in regular text. The page number from the report is noted, so if you would like to read more, or read it directly from the report, you can go right to the appropriate page.

1. Wardrop, p. 4

"Totaling 378,600 acres, Northern Dynasty's direct and indirect interests in the Pebble region forms a contiguous block consisting of 3,108 located AlaskaStatemineral claims."

@ 640 acres/sq.mi. = 591.56 square miles

2. Wardrop, p. 6

"Phases of development beyond 25 years will require separate permitting and development decisions to be made in the future ..."

"This initial phase of mining would process about two billion tons of ore ..."

"The level of engineering applied to the 45-year Reference Case is similar to that in the 25-year IDC Case, with the exception of detailed engineering associated with tailings storage after Year 25. This extended phase of mining will process a total of some 3.8 billion tons of ore ..."

"Wardrop has selected the 45-year Reference Case as the base case for this Preliminary Assessment due to its enhanced level of development of the Pebble mineral resource within a timeframe that makes a significant contribution to the project's Net Present Value (NPV)."

This means that NDM is showing us the mine plan for a 25-year development, while the Preliminary Assessment was developed mainly on the basis of the 45-year case. Most notably the 45-year case lacks plans for tailings disposal.

3. Wardrop, p. 7

"Each of the three development cases described in this Preliminary Assessment employ open pit mining methodologies only. However, it is expected that additional underground investigations would be undertaken during the initial 25 years of production."

Open pit mining only considered in these development scenarios.

4. Wardrop, p. 8

"The Pebble Project would be a large industrial facility located within a vast region of Alaskanotable for its undeveloped wilderness, isolated and sparsely populated communities, AlaskaNative culture and traditional ways of life, significant salmon fisheries, and other fish and wildlife populations."

From and environmental and social standpoint this statement tells it all.

5. Wardrop, p. 10

The transportation corridor would include a two-lane, all-weather permanent access road.

The transportation corridor would include four buried, parallel pipelines, including:

- a copper?\gold concentrate slurry pipeline from the mine site to the port;
- a return water pipeline from the port site to the mine;

- a natural gas pipeline from the port site to the mine to fuel a natural gas?\fired generating plant at the mine site; and

- a diesel fuel pipeline from the port site to the mine.

6. Wardrop, p. 12

"Energy requirements for the Pebble Project would be met via a 378 MW combined?\cycle natural gas-fired turbine plant at the mine site, as well as an 8 MW natural gas?\fired generation plant at the port site."

7. Wardrop, p. 37

(Preliminary Assessment of the Pebble Project, Southwest Alaska, Wardrop-Northern Dynasty Mines, February 17, 2011)

From Figure 1.7.2, I get the following dimensions:

- 25-year Pit: ≈ 12,000 feet-length x 2,500 feet-depth

- 45-year Pit: ≈ 14,000 feet-length x 2,800 feet-depth

- 78-year Pit: ≈ 17,000 feet-length x 4,000 feet-depth

8. Wardrop, p. 38

Key operating assumptions for open pit mining of the Pebble deposit include:

- 350 days of operation per year;

- two 12-hour shifts per day;

- autonomous trucking;

The 'autonomous trucking' means no drivers for the ore and waste haul trucks. Truck drivers are typically one of the jobs for which locals can be easily trained.

and;

"The use of autonomous trucks has been shown to add significant value to the Pebble Project. Additional automation opportunities,

such as blasthole drilling, would likely have analogous benefits." (p. 84)

An excellent example of a profits-over-jobs analysis.

9. Wardrop, p. 39

"The 45-year Reference Case has a mining rate of approximately 1,000,000 tons per day between years 25 and 35."

Wow ?C this is big time mining (figure include both ore and waste rock)

10. Wardrop, p. 50

"Run-o-mine (ROM) ore from the open pit would be crushed and conveyed to the concentrator. The ore feed would be ground to liberate the mineral values from the host rock, and then separated by industry-standard flotation processes. A bulk copper/molybdenum sulphide concentrate would pass through the molybdenum separation circuit to produce a molybdenum sulphide concentrate, which would be bagged and trucked to port facilities on Cook Inlet. The molybdenum separation generates a copper concentrate (containing most of the recovered gold) that would be pumped through a pipeline to the port site. The pyrite concentrate would report to a secondary gold recovery circuit where gold doré and bagged carbon-bearing fines would be produced and shipped off-site. Recovered gravity gold would be sent to the copper concentrate."

They don't say how they would produce the gold doré. However they do say that "Recovered gravity gold would be sent to the copper concentrate." Since the 'gravity gold' is not going into the gold doré, it raises the question of where the gold doré is coming from ?C cyanide processing? The word 'cyanide' is not mentioned in this report, however Figure 1.8.1 ?C Simplified Process Flowsheet, does mention "gold leaching" of the pyritic tailings which would likely involve the use of cyanide to extract gold and silver.

11. Wardrop, p. 52

"The option selected for the 25?\year IDC Case is the Site G TSF, located approximately three miles west of the open pit. The TSF impoundment would be created by three embankments. The north embankment would be constructed initially to a height of approximately 200 ft. This embankment is raised each year, while the south and east embankments would be built later in the mine life as the impoundment fills. The ultimate height of the north embankment would be approximately 685 ft, while ultimate heights for the south and east embankments would be approximately 450 ft and 100 ft respectively."

TSF G would hold approximately 2 billion tons of tailings, enough for the first 25 years of operation. Since the 45-year Case is 'base case' for financial analysis, TSF G, which cannot be expanded further, will not supply enough tailings storage for even the base case mine. Additional tailings storage space would be required.

12. Wardrop, p. 52

"... the upstream toe of the (TSF G) embankment, overburden and broken rock at the top of the bedrock would be excavated to solid bedrock, and a grout curtain injected below that point to minimize seepage below the embankment."

Even if they are successful in keying the liner on the upstream dam face into bedrock, and adding a grout curtain, at the TSF G location, it is likely that tailings dams at the additional locations needed for the 45-year or 78-year mine buildout could not be similarly engineered because of problems finding nearby locations where bedrock is shallow enough to locate a large tailings impoundment dam. This is probably one reason NDM does not want to talk about future tailings dam locations at this time.

13. Wardrop, p. 55

"The water management plan associated with the three successive development cases presented in this Preliminary Assessment has three distinct phases ?C construction, operations, and closure."

and;

"Surplus water would be treated to meet regulatory requirements before being discharged."

and;

"At closure ... water levels would be maintained by treating inflow and discharging it as during operations."

From these statements it appears that NDM anticipates water treatment and discharge will be required during operation and after mine closure.

14. Wardrop, p. 73

"It has been assumed in the financial evaluation that the Pebble Partnership will enter into strategic partnerships as needed to develop, finance and operate a number of infrastructure assets ?C including the transportation corridor (port & road) and the power plant."

In other words, someone else will pay the capital costs of constructing and operating these facilities, and PLP will pay for the products (road access and power) as a part of its operating costs.

15. Wardrop, p. 74

Sustaining Capital Costs ($M) ?C Waste Management

- 25-year Case - $846 million
- 45-year Case - $2,211 million
- 78-year Case - $3,364 million

It's very expensive to build waste management facilities (mainly tailings dams), billions of dollars in the 45 and 78-year cases. This is the primary reason there will be no liners for these tailings facilities ?C and why lake disposal is so attractive to the mining industry.

16. Wardrop, p. 79

Table 1.11.12 Pebble Project ?C Summary Financial Results

- Pre-Tax Payback (under assumed long-term metals prices) ≈ 6.3 years
- Pre-Tax Payback (under present metals prices) = 3.2 years

NDM can anticipate this being a very profitable mine.

17. Wardrop, p. 83

"The Pebble deposit is very large, and even the 78?\year Resource Case would exploit only 55% of the total resource."

This basically says they need to go to underground mining (block caving) to get all of the resource.